1 – 10. (Cancelled)

11. (allowed) An assembly for use as a high pressure fluid jet cutting nozzle comprising:

a nozzle body having an upstream portion at a first end, a downstream portion at a second end, a middle portion between the upstream portion and the downstream portion, and an axis;

a first bore extending from the first end to the second end, generally parallel to the axis;

a mixing cavity in the middle portion communicating with the first bore;

a second bore defined by the nozzle body for introducing abrasive material into the mixing cavity,

the downstream portion including a mixing tube having an upstream end and a downstream end, the mixing tube being coaxial with the first bore and downstream of the mixing cavity, and

a cylindrical nozzle guard coaxial with and encircling the mixing tube and extending downstream as far as the downstream end of the mixing tube.

12. (allowed) The assembly of claim 11 wherein the second bore has an axis and the axis is not parallel with the nozzle body axis.

13. (allowed) The assembly of claim 11 wherein the second bore is in direct communication with the mixing cavity.

14. (allowed) The assembly of claim 11 wherein the first bore is in communication with a high pressure cavity defined by the upstream portion having a generally cylindrical side wall and a bottom wall generally normal to the axis of the nozzle body wherein a transition portion between the side wall and the bottom wall has a generally

quarter circle curvilinear sectional profile to provide a constant radius transition between the side wall and the bottom wall.

15. (cancelled)

16. (allowed) The assembly of claim 11 further comprising a jewel defining an orifice coaxial with the nozzle body axis located upstream of the mixing cavity.

17. (allowed) The assembly of claim 16 wherein the upstream portion of the nozzle body defines a high pressure cavity and the jewel is disposed in a recess in a bottom wall of the high pressure cavity.

18. (allowed) The assembly of claim 17 further comprising a soft seal adjacent an opening of the high pressure cavity to provide a sealing means between the assembly and an inlet body.

19. (allowed) The assembly of claim 11 further comprising a soft seal located at the upstream portion of the nozzle body to provide a sealing means between the assembly and an inlet body.

20. (new) For use in abrasive water jet cutting systems, an orifice body with a mixing cavity, comprising:

a. a metal body having an outer cylindrical surface and a central bore, parallel to the cylindrical surface, with an upstream direction and a downstream direction;

b. a jewel having an orifice mounted in the bore in the metal body, a portion of the central bore downstream of the jewel forming a mixing cavity; and

c. an inclined bore for abrasive material passing from the outer cylindrical surface to the central bore at an incline and joining the central bore downstream of the jewel at an angle such that abrasive material is redirected by substantially less than 90 degrees as it passes from the inclined bore to the central bore that forms the mixing cavity.

21. (new) The orifice body with a mixing cavity of claim 20 wherein the angle that abrasive material is redirected is approximately 45 degrees

22. (new) The orifice body with a mixing cavity of claim 20 further comprising:

d. a tapered seat formed in the metal body at a downstream end of the mixing cavity, a portion of the tapered seat forming a conical section having metal of the metal body outside of the conical section and having void inside of the conical section.

23. (new) The orifice body with a mixing cavity of claim 20 further comprising:

d. a rotational alignment slot in the cylindrical surface, parallel to the cylindrical surface, opposite the bore for abrasive material, extending from an upstream end of the cylindrical surface to a downstream end of the cylindrical surface.

24. (new) For use in abrasive water jet cutting systems, an orifice body with a mixing cavity, comprising:

a. a metal body having an outer cylindrical surface, with an upstream direction and a downstream direction;

b. a central bore, parallel to the cylindrical surface;

c. a jewel having an orifice mounted in the bore in the metal body, a portion of the central bore downstream of the jewel forming a mixing cavity;

d. a bore for abrasive material passing from the outer cylindrical surface to the mixing cavity; and

e. a rotational alignment slot in the cylindrical surface, parallel to the cylindrical surface, opposite the bore for abrasive material, extending from the upstream end of the cylindrical surface to the downstream end of the cylindrical surface.

25. (new) The orifice body with a mixing cavity of claim 24 wherein the slot has a width approximately equal to the diameter of a pin designed to retain the orifice body against rotation.

26. (new) The orifice body with a mixing cavity of claim 24 further comprising:

d. a tapered seat formed in the metal body at a downstream end of the mixing cavity, a portion of the tapered seat forming a conical section having metal of the metal body outside of the conical section and having void inside of the conical section.

27. (new) For use in abrasive water jet cutting systems, an orifice body with a mixing cavity, comprising:

a. a metal body having an outer cylindrical surface;

b. a central bore, parallel to the cylindrical surface, with an upstream direction and a downstream direction;

c. a jewel having an orifice mounted in the bore in the metal body, a portion of the central bore downstream of the jewel forming a mixing cavity;

d. a bore for abrasive material passing from the outer cylindrical surface to the mixing cavity; and

e. a tapered seat formed in the metal body at a downstream end of the mixing cavity, a portion of the tapered seat forming a conical section having metal of the metal body outside of the conical section and having void inside of the conical section.

28. (new) The orifice body with a mixing cavity of claim 27 wherein the surface of the conical section is inclined at approximately 45 degrees from the cylindrical surface.